

THE INVENTION CLAIMED IS

1. An imaging spectrometer apparatus, comprising:
an entrance slit for directing light,
a lens that receives said light and directs said light,
a grating that receives said light from said lens and defracts said light
back onto said lens which focuses said light, and
a detector array that receives said focused light.
2. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings immersed into a germanium surface.
3. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings immersed into a wedged germanium grating.
4. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings immersed into a flat germanium grating.
5. The imaging spectrometer apparatus of claim 4 wherein said grating
has equally spaced straight rulings.
6. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings that have varying ruling spacings.
7. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings that are curved.
8. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings that are cut on the back of a wedged plano-convex lens.
9. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings that are cut on the back of a wedged plano-concave lens.
10. The imaging spectrometer apparatus of claim 1 wherein said grating
has rulings that are cut on the back of a wedged germanium prism.

11. The imaging spectrometer apparatus of claim 1 wherein said apparatus has a front and a back, and wherein said entrance slit and said detector array are located at or near said front, and wherein said lens is located at or near said back.

12. The imaging spectrometer apparatus of claim 11 wherein said entrance slit, said grating, said lens, and said detector array fit within an envelope located between said front and said back.

13. The imaging spectrometer apparatus of claim 12 wherein said envelope is 3.0 cm by 3.7 cm by 1.6 cm or smaller.

14. The imaging spectrometer apparatus of claim 12 wherein said envelope is 2.3 cm by 2.2 cm by 1.4 cm or smaller.

15. The compact imaging spectrometer apparatus of claim 12 wherein said envelope is 6.0 cm by 6.0 cm by 3.1 cm or smaller.

16. The imaging spectrometer apparatus of claim 1 wherein said lens is a catadioptric lens.

17. The imaging spectrometer apparatus of claim 1 wherein said lens is a ZNSE catadioptric lens.

18. The imaging spectrometer apparatus of claim 1 wherein said lens has rotationally symmetric surfaces.